FIG 1

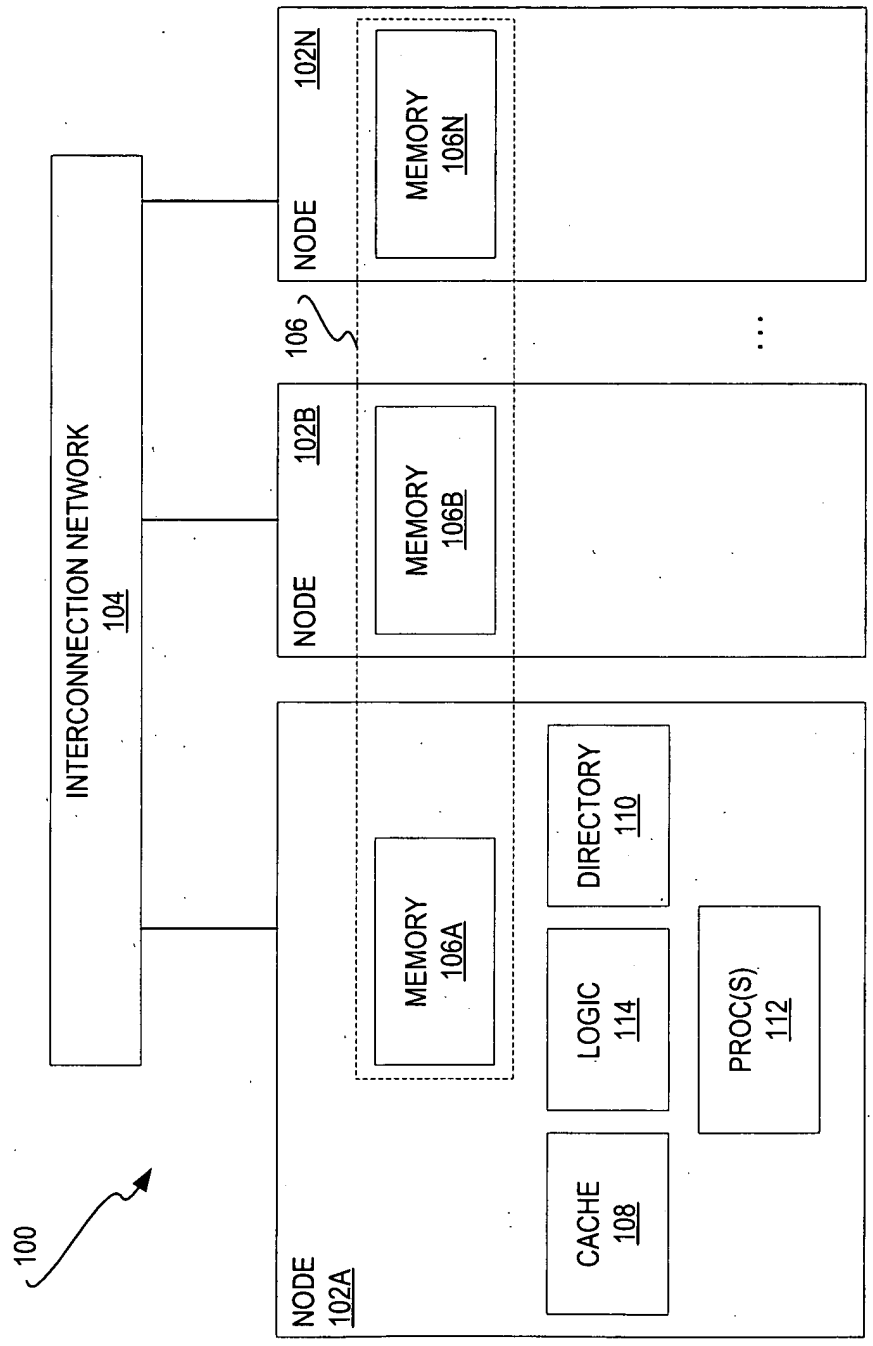

100
INTERCONNECTION NETWORK
104
NODE
102A
MEMORY
106A
CACHE
108
LOGIC
114
DIRECTORY
110
PROC(S)
112
106
NODE
102B
MEMORY
106B
NODE
102N
MEMORY
106N

FIG 2

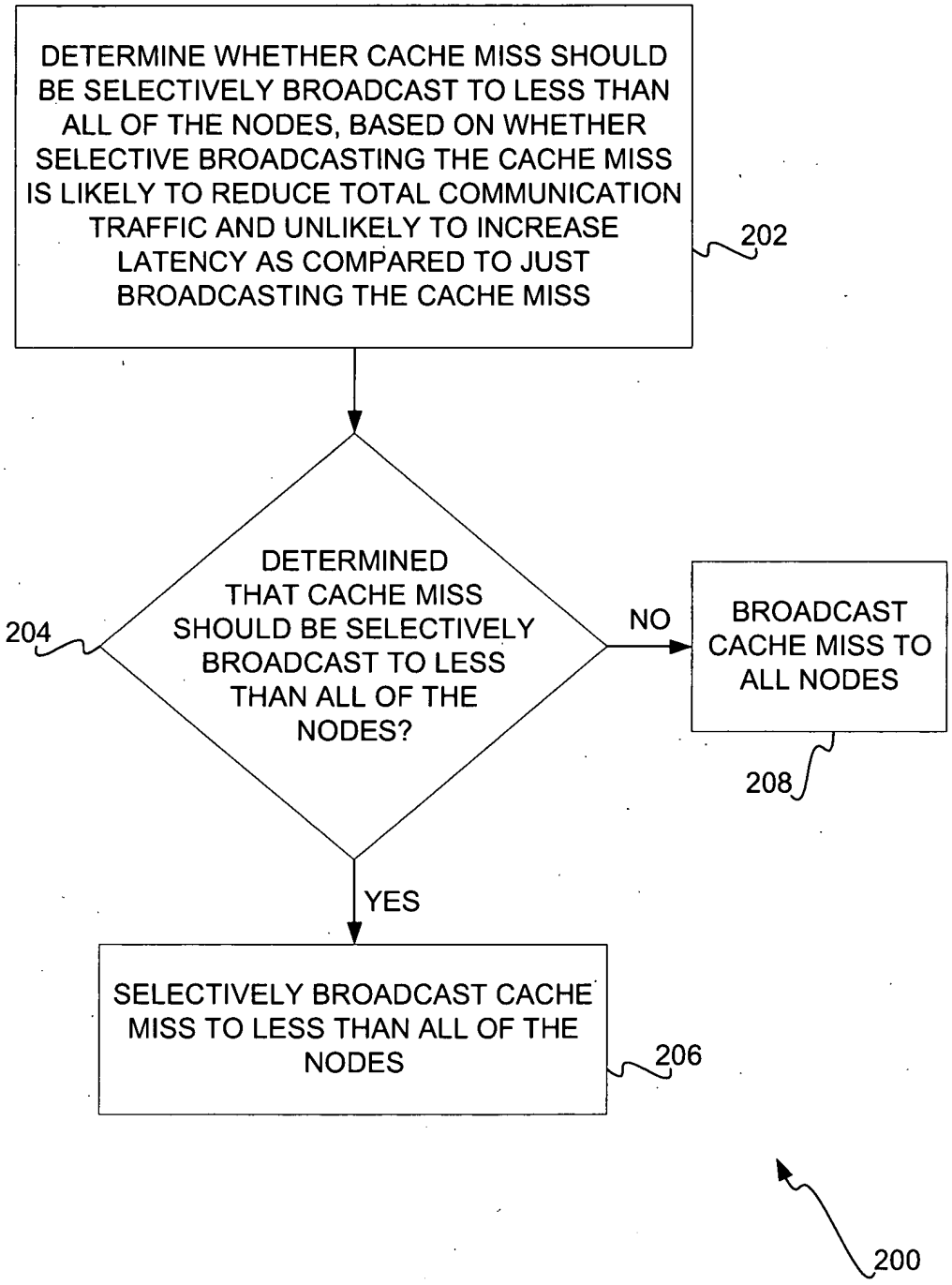

DETERMINE WHETHER CACHE MISS SHOULD BE SELECTIVELY BROADCAST TO LESS THAN ALL OF THE NODES, BASED ON WHETHER SELECTIVE BROADCASTING THE CACHE MISS IS LIKELY TO REDUCE TOTAL COMMUNICATION TRAFFIC AND UNLIKELY TO INCREASE LATENCY AS COMPARED TO JUST BROADCASTING THE CACHE MISS
202
DETERMINED THAT CACHE MISS SHOULD BE SELECTIVELY BROADCAST TO LESS THAN ALL OF THE NODES?
204
NO
BROADCAST CACHE MISS TO ALL NODES
208
YES
SELECTIVELY BROADCAST CACHE MISS TO LESS THAN ALL OF THE NODES
206
200

FIG 3

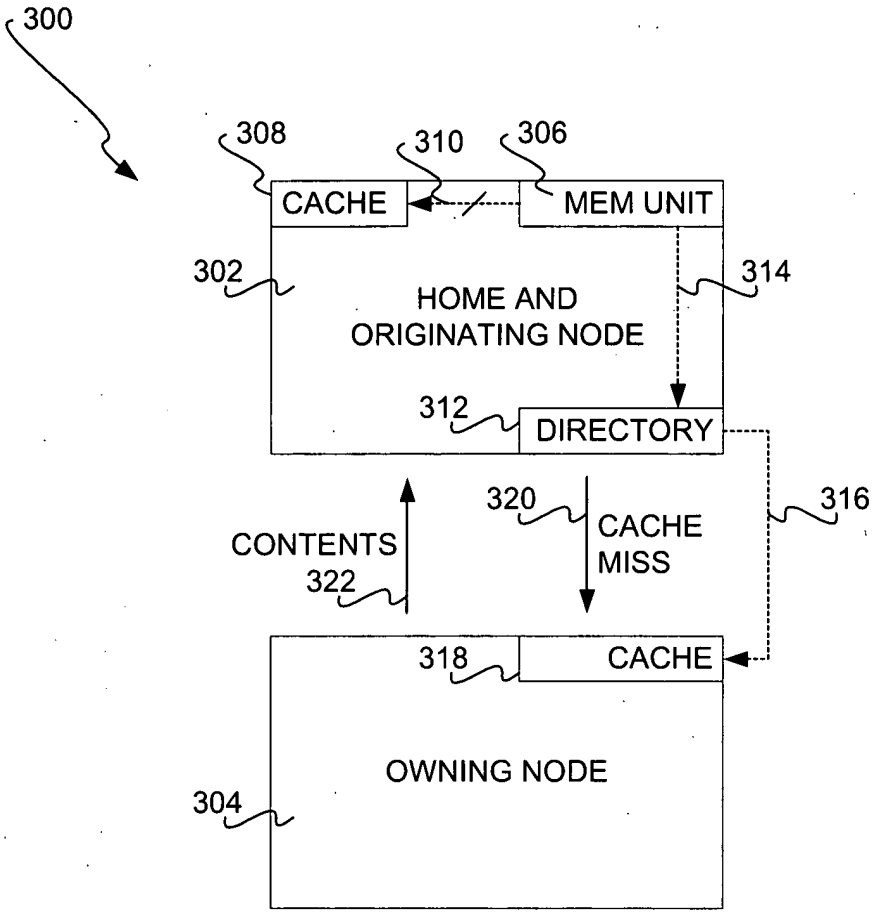

300
308
310
306
CACHE
MEM UNIT
302
HOME AND
ORIGINATING NODE
314
312
DIRECTORY
316
320
CACHE
MISS
CONTENTS
322
318
CACHE
OWNING NODE
304

FIG 4

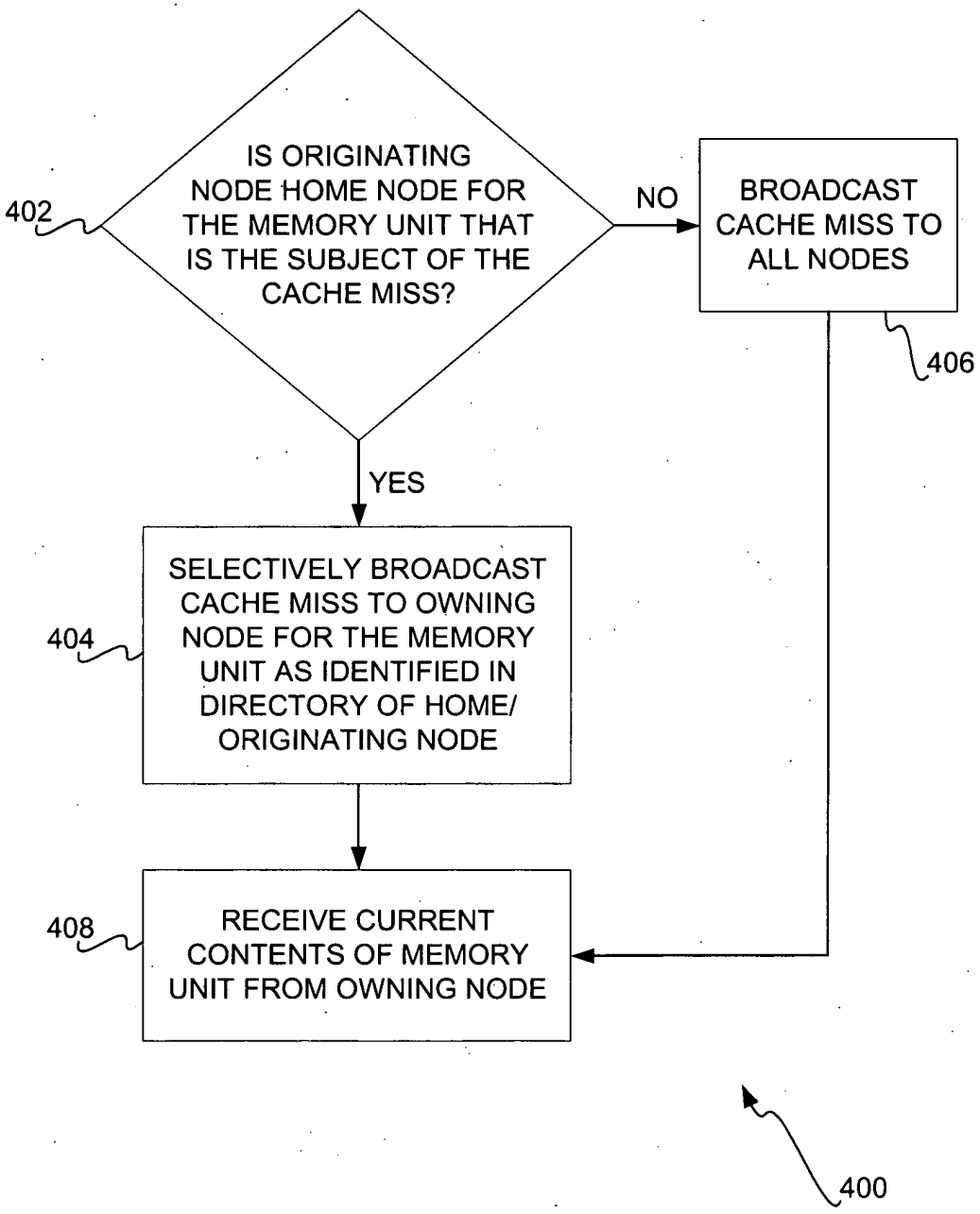

IS ORIGINATING NODE HOME NODE FOR THE MEMORY UNIT THAT IS THE SUBJECT OF THE CACHE MISS?
402
NO
BROADCAST CACHE MISS TO ALL NODES
406
YES
SELECTIVELY BROADCAST CACHE MISS TO OWNING NODE FOR THE MEMORY UNIT AS IDENTIFIED IN DIRECTORY OF HOME/ ORIGINATING NODE
404
RECEIVE CURRENT CONTENTS OF MEMORY UNIT FROM OWNING NODE
408
400

FIG 5

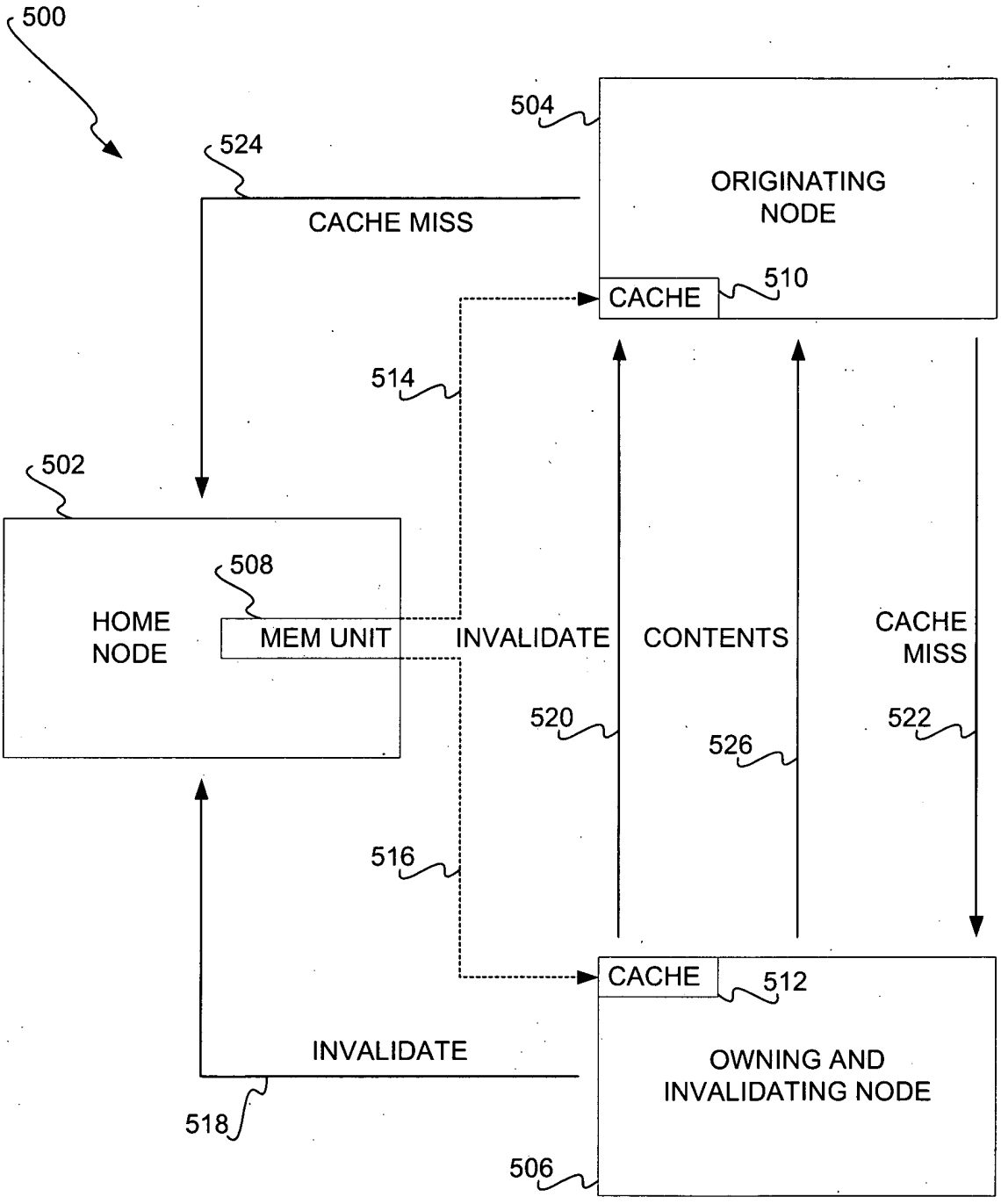

500
504
524
ORIGINATING NODE
CACHE MISS
CACHE
510
514
502
508
HOME NODE
MEM UNIT
INVALIDATE
CONTENTS
CACHE MISS
520
526
522
516
CACHE
512
INVALIDATE
OWNING AND INVALIDATING NODE
518
506

FIG 6

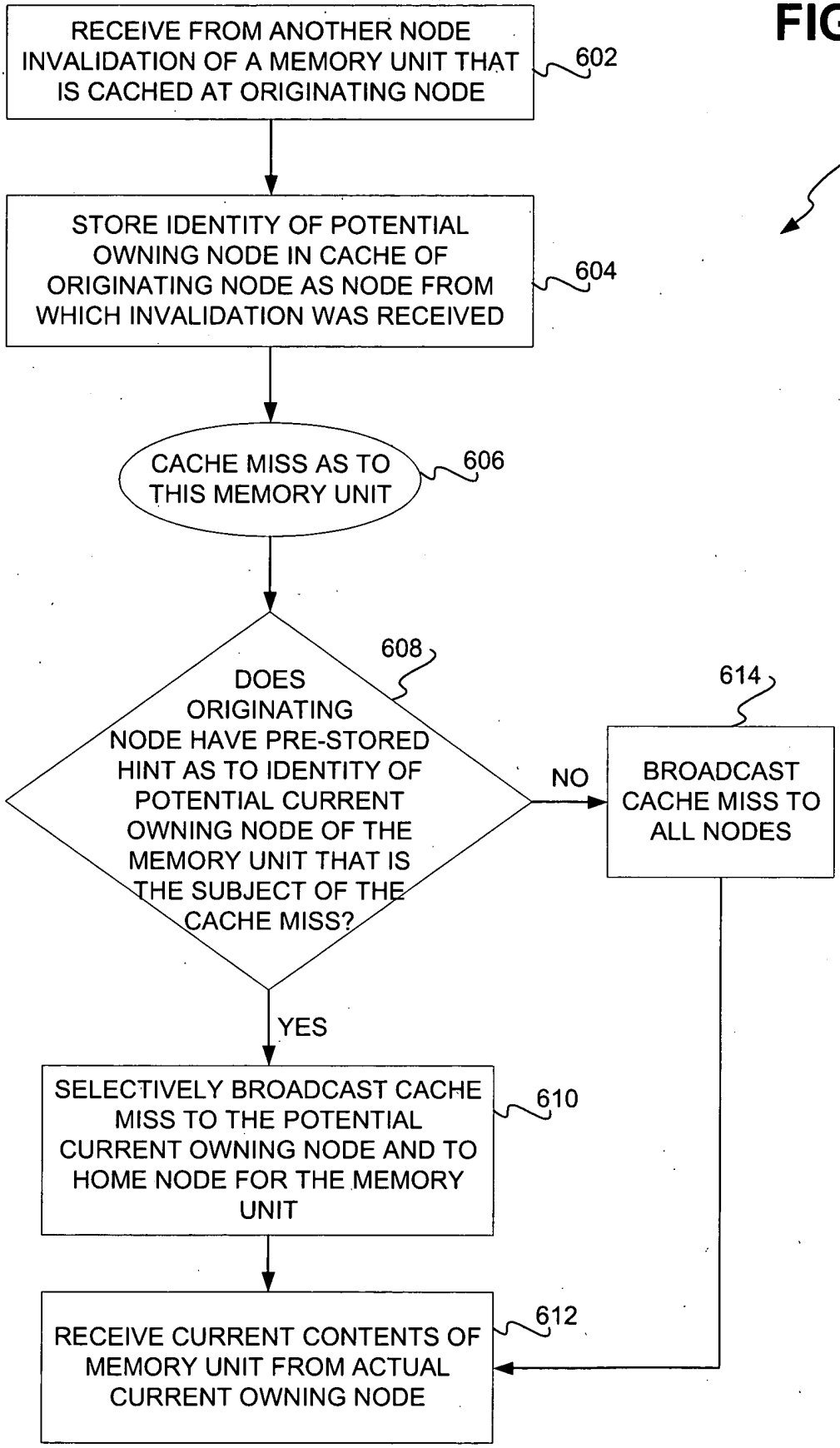

600
RECEIVE FROM ANOTHER NODE INVALIDATION OF A MEMORY UNIT THAT IS CACHED AT ORIGINATING NODE
602
STORE IDENTITY OF POTENTIAL OWNING NODE IN CACHE OF ORIGINATING NODE AS NODE FROM WHICH INVALIDATION WAS RECEIVED
604
CACHE MISS AS TO THIS MEMORY UNIT
606
DOES ORIGINATING NODE HAVE PRE-STORED HINT AS TO IDENTITY OF POTENTIAL CURRENT OWNING NODE OF THE MEMORY UNIT THAT IS THE SUBJECT OF THE CACHE MISS?
608
NO
614
BROADCAST CACHE MISS TO ALL NODES
YES
SELECTIVELY BROADCAST CACHE MISS TO THE POTENTIAL CURRENT OWNING NODE AND TO HOME NODE FOR THE MEMORY UNIT
610
RECEIVE CURRENT CONTENTS OF MEMORY UNIT FROM ACTUAL CURRENT OWNING NODE
612

FIG 7

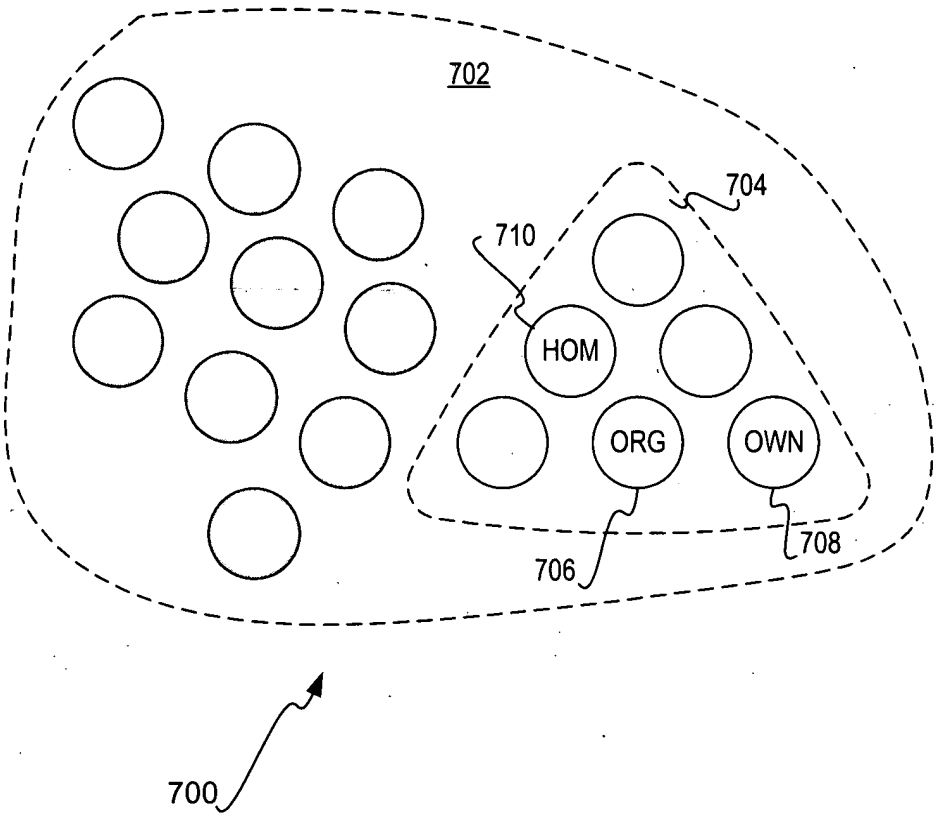


FIG 8

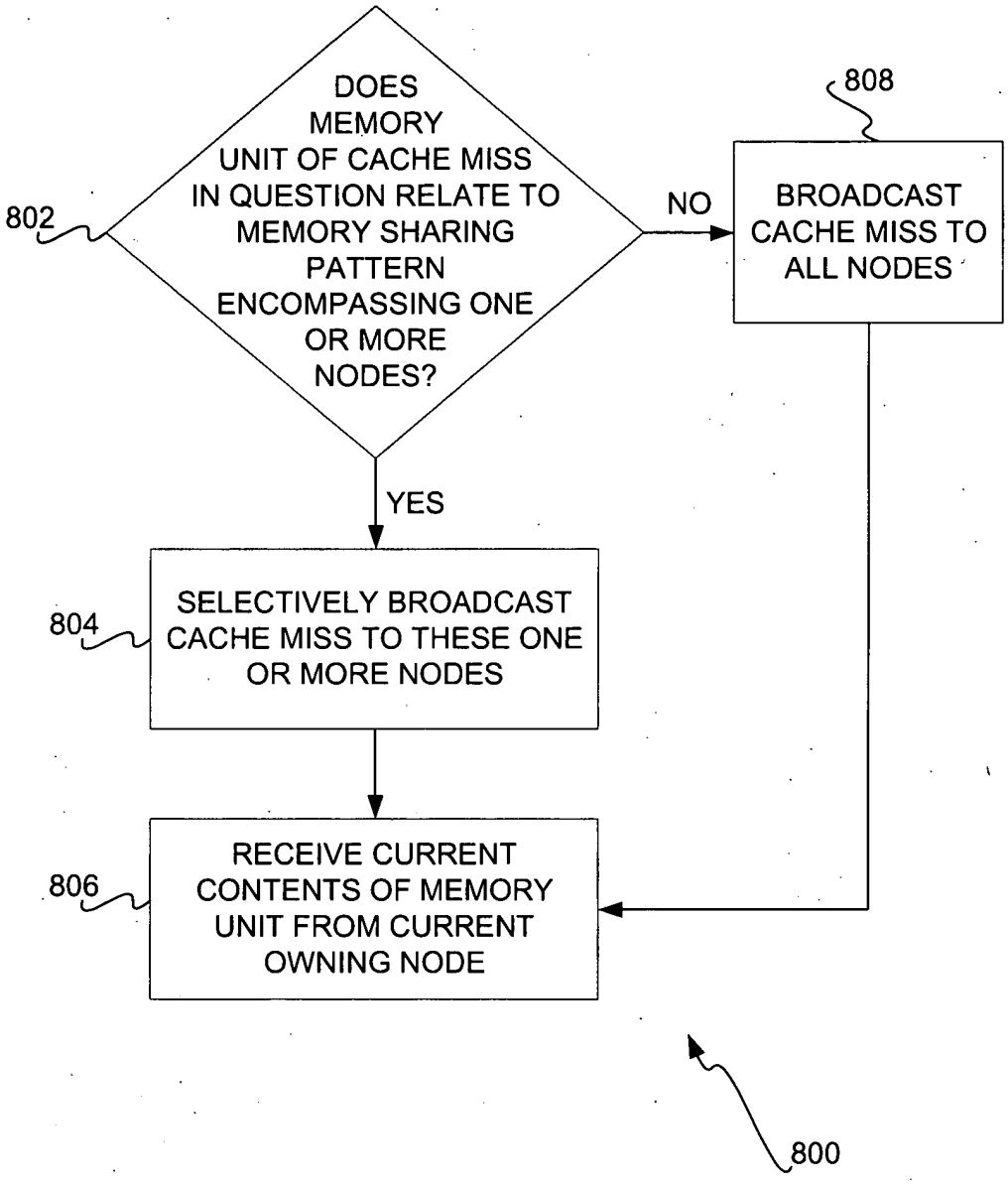
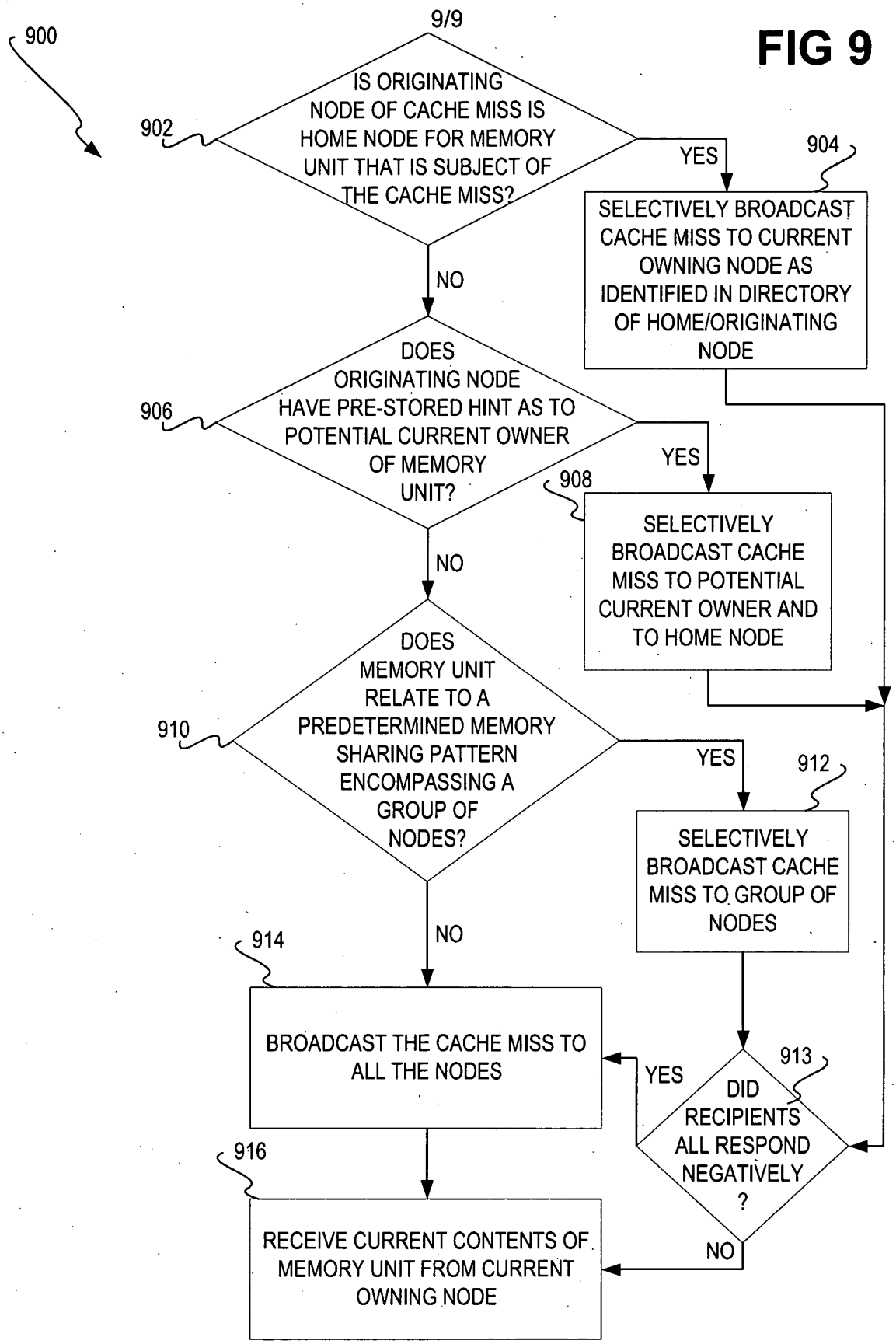

DOES MEMORY UNIT OF CACHE MISS IN QUESTION RELATE TO MEMORY SHARING PATTERN ENCOMPASSING ONE OR MORE NODES?
802
NO
808
BROADCAST CACHE MISS TO ALL NODES
YES
804
SELECTIVELY BROADCAST CACHE MISS TO THESE ONE OR MORE NODES
806
RECEIVE CURRENT CONTENTS OF MEMORY UNIT FROM CURRENT OWNING NODE
800

FIG 9


900
902
IS ORIGINATING NODE OF CACHE MISS IS HOME NODE FOR MEMORY UNIT THAT IS SUBJECT OF THE CACHE MISS?
YES
904
SELECTIVELY BROADCAST CACHE MISS TO CURRENT OWNING NODE AS IDENTIFIED IN DIRECTORY OF HOME/ORIGINATING NODE
NO
906
DOES ORIGINATING NODE HAVE PRE-STORED HINT AS TO POTENTIAL CURRENT OWNER OF MEMORY UNIT?
YES
908
SELECTIVELY BROADCAST CACHE MISS TO POTENTIAL CURRENT OWNER AND TO HOME NODE
NO
910
DOES MEMORY UNIT RELATE TO A PREDETERMINED MEMORY SHARING PATTERN ENCOMPASSING A GROUP OF NODES?
YES
912
SELECTIVELY BROADCAST CACHE MISS TO GROUP OF NODES
NO
914
BROADCAST THE CACHE MISS TO ALL THE NODES
913
DID RECIPIENTS ALL RESPOND NEGATIVELY ?
YES
NO
916
RECEIVE CURRENT CONTENTS OF MEMORY UNIT FROM CURRENT OWNING NODE